TOWN OF NEEDHAM, MASSACHUSETTS

Department of Environmental Protection
Technical Assistance Grant

Spring 2005

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I. EXECUTIVE SUMMARY

In October 2004, the Town of Needham received a Municipal Recycling Technical Assistance Grant from the Massachusetts Department of Environmental Protection (DEP) to assist in an effort to improve the Town's recyclable materials diversion rate. The target population would be the public schools; building on their existing program to better assess how much additional paper could be recovered from the waste stream and to identify opportunities to divert other recyclable materials. With Technical Assistance provided by Kathi Mirza, this project would entail 1) an effort to establish baseline data about the current recycling program in the schools; 2) a waste assessment at all schools to determine the volume of waste generated and currently diverted; 3) interviews with school personnel and site visits to gather information on how the program could be expanded; and 4) a summary of research with recommendations on where to go from here.

The results of this research are highlighted below:

The Town of Needham's current trash contract (with Wellesley Trucking) provides for the collection of up to 11,024 cubic yards of waste from all schools and public buildings serviced in a given year. If it can be shown that waste generation would decrease substantially based on a new waste reduction practice and/or increased recycling, there is an opportunity for the town to either reduce the size of the dumpster at any given location and/or reduce service levels, which in turn would lower collection (and associated disposal) costs. It should be noted that the Commonwealth of Massachusetts has Waste Ban regulations prohibiting the disposal (and transfer for disposal) of easily recyclable and hazardous items (such as paper, cardboard, and bottles & cans).

Trash service is under the supervision of the Municipal Building Maintenance Division: therefore, schools are not explicitly responsible for the management and cost of trash disposal. It could be very instructive to work with school purchasing agents to make the connection between supplies purchased and trash volumes generated (along with associated costs). Since the cost for trash removal is not apparent to (or the responsibility of) purchasing agents, an effort to bring these parties together to identify opportunities for waste reduction and potential cost savings could prove very beneficial to overall recycling program goals.

When one takes into account the volume of waste generated (based on custodial assessments, dumpster size and collection frequency), combined with an educated estimate of the weight of a cubic yard of school-generated solid waste (from schools that have weighed their trash), we can *estimate* that between 827 and 992 tons of trash are being generated at Needham Public Schools (exclusive of other municipal buildings) in a given school year. The student population at all Needham schools in fiscal year 2005 is 4,902 students. Therefore, each student is generating between 337 and 405 lbs. of waste on average per year (this includes the waste generated by the 647 on-site staff supporting these students).

The large-volume materials entering and leaving the school buildings during a typical school year include paper (including cardboard), bottles & cans, organic waste (food and other compostable items), and polystyrene food service ware. By weight, we have estimated that between 25-47 % of the waste stream is paper, and that between 10-18% of the waste stream is comprised of plastic, metal, and glass containers. **This indicates that a very large portion (at least 1/3) of what is generated at the schools is *easily recycled* through the current program at the Town's Recycling Transfer Station (RTS).** Another 15-32% of organic waste could be composted (food, soiled paper, leaves, grass), if a cost-effective system were put into place to separate these materials. Polystyrene food service ware that is

purchased in very large quantity should also be addressed, as this uses a substantial amount of the dumpster *volume* for trash, and the hauler is essentially "transporting air" since those materials are so lightweight, making it extremely costly to manage.

On a monthly basis, schools are currently recycling about 2.77 tons of paper (including some cardboard), through a collection program provided by the Town's Department of Public Works. Since the schools are generating between 69 and 83 tons of solid waste per month, the current recycling rate for paper is approximately 3.2-3.9% (recycling tons/total tons generated).

For *every ton* of waste reduced (or recycled instead of being thrown into trash), dumpster capacity (or associated collection frequency) could be reduced by between 11-13 cubic yards (with average estimated weight of 150-180 lbs./cubic yard). This could result in significant cost savings for trash collection services. Given our estimate that currently between 827 and 992 tons of trash are being generated at Needham Public Schools, a 10% reduction in trash allows for a reduction of 909-1,287 cubic yards collected. A 20% reduction in trash allows for a reduction of 1,819-2,579 cubic yards collected.

It is recommended that programs be expanded and/or developed to capture the following recyclable materials, in order based on ease of implementation and program impact:

- If the recycling program could **capture 50%** of paper and cardboard generated (approximately 13-24% of the waste stream) trash tonnage could be reduced by 10-20% by weight. A 15% reduction in trash would result in approximately 703-843 tons of trash per year (a reduction of 124-149 tons). The associated reduction in trash volume would be 1,378-1,986 cubic yards, or 1,682 cubic yards on average each year. *Weekly* trash collection could be reduced by approximately 42 cubic yards under this scenario.
- If the recycling program could **capture 50%** of the bottles & cans generated, trash tonnage could be reduced by an estimated 5-9% by weight. The trash tonnage could therefore be reduced by approximately 7% or 58-69 tons. The associated reduction in trash volume would be 644-920 cubic yards, or 782 cubic yards on average each year. *Weekly* trash collection could be reduced by approximately 20 cubic yards with a bottle & can collection program.

In addition to the above-mentioned items that are easily recycled through Needham's RTS, it is estimated that approximately one half or 50% of the waste that school custodians transport to dumpsters is generated in the cafeteria and kitchen.

- Needham schools may benefit from developing an organics composting program, including food waste and possibly soiled-paper waste and biodegradable food service ware. The City of Northampton has a ***food-waste*** composting program in place at five schools, and on average, they collect 46 lbs/student/year (food waste). Their Program Coordinator advised that most of the weight is coming from the kitchen, and some is from plate scrapings. If Needham's 4,902 students separated food waste for composting at this rate, 225,492 lbs. (113 tons) could be composted each year. This represents an 11-14 % reduction in trash. However, if Needham schools conduct less food preparation in the kitchen than Northampton schools, the amount of food waste that could be captured for composting may be less than this estimate.
- Purchasing records indicate that schools are throwing away nearly ½ million (450,000) ***polystyrene food service trays*** in a 10-month school year. Observations made by custodians and the Project Coordinator attest to the fact that as much as half the *volume* of waste coming out of the cafeteria each day is polystyrene food trays. If an alternative method for managing trays proved feasible (e.g., recycling trays, switching to compostable paper trays, or converting to

reusable/washable trays), it is estimated that Needham could divert an additional 15-25% of the waste stream (by volume). Recycling polystyrene food service ware does present a challenge since the recycling markets for polystyrene trays are few and far between. The most feasible alternative is to switch to biodegradable paper trays, biodegradable utensils, and to institute a food waste composting program where food and trays are collected together.

II. Background

In October 2004, the Town of Needham received a Municipal Recycling Technical Assistance Grant from the Massachusetts Department of Environmental Protection (DEP) in response to a request for assistance with the Town's public school recycling efforts. The grant provided Needham with DEP personnel time to assist with an evaluation of Needham's Public School recycling program.

Municipal Partners on this project include:

Charles (Chip) Laffey, Superintendent, Solid Waste and Recycling Division
Kristine Carbonneau, Senior Program Manager, RTS-Landfill
Paul Comerford, Supervisor, Municipal Building Maintenance Division

III. Goal Setting: Scope of Services

DEP awarded a grant to Needham, consisting of 40 hours of technical assistance provided by Kathi Mirza, Project Coordinator. Working closely with the Municipal Partners, the Scope of Work was written to address the primary goals of the grant request, taking into account the time allotted for assistance through this grant.

The goal of this grant was to assist the Town of Needham in their effort to improve the Town's recyclable materials diversion rate. To do this they decided to target the public schools, building on their existing program to better assess how much additional paper could be recovered from the waste stream and to identify opportunities to divert other recyclable materials.

Task One: Establish baseline data

The Project Coordinator would estimate historical trash tonnages based on number of containers in service, size of containers, and frequency of pick-up (taking into account service changes over time).

Task Two: Conduct waste assessment at public schools

The Project Coordinator would research methods for conducting waste assessments and create a form to assist with waste stream assessment. A waste stream assessment of all public schools would be conducted with assistance from school custodians, with oversight from the Municipal Building Maintenance Division (MBMD) Supervisor.

Task Three: Conduct interviews and school site visits

The Project Coordinator would identify recycling contacts in each school (teachers, custodians, administration, food service) and interview them to assess program strengths, weaknesses, and opportunities for improvement. Interviews and site visits to schools would seek to quantify various types of items purchased that may end up in the waste stream (e.g., cases of paper, cartons of milk, vending machine containers). Interviews would also identify opportunities for diverting additional materials from the waste stream for recycling.

Task Four: Summarize data and make recommendations
Data gathered through waste assessments, interviews, site visits, and general research would be compiled and analyzed. Summary report would include estimates of current solid waste tonnage, additional paper that could be recovered from the waste stream, and recommendations for maximum recovery of paper and other recyclable materials.

IV. Process/Research Methodology

The Project Coordinator utilized the following methods to collect information pertaining to the goals of this project:

Site visits: Site visits were conducted by Project Coordinator with MBMD Supervisor at three representative schools to identify types of waste generated, sources of waste, and to assess infrastructure for collection of waste and recyclables. Schools visited included Needham High School, Pollard Middle School, and Newman Elementary School.

Waste Assessments: Waste assessments were conducted by MBMD custodians at all Needham public schools under the supervision of Paul Comerford. The Project Coordinator created a waste assessment form (see Attachment 1) for custodians to use to estimate the volume of waste generated and identify types and volumes of non-bagged waste that was deposited into school dumpsters. Project Coordinator met with custodians and MBMD Supervisor to review form and discuss how it would be used. Custodians were asked to fill out one form each time (night before) dumpsters were scheduled to be emptied, over the course of a two-week period in December 2004.

Surveys: The Project Coordinator created a one-page survey (see Attachment 2) to distribute to school principals and selected teachers (upon consent or recommendation from school officials) to solicit their feedback about the current system for recycling and ideas for program improvements. Surveys were distributed to principals of all Needham schools (High School, Pollard Middle School, and four elementary schools), with the exception of the Mitchell School, where a recycling program is being initiated at this time. With the help of Nathaniel Woodruff (Environmental Science teacher at the High School), surveys were distributed to all high school teachers (approximately 130 in total). Paul Richards, Needham High School Principal, supported this effort as well.

Interviews: To gain in-depth information about waste collection practices, a meeting was held with MBMD custodians to collect their feedback about how recycling could be expanded in the schools. To gather information about purchasing practices, discussions/interviews were conducted with Ruth Griffin, Food Service Director; Sandy Cincotta, Budget Analyst for Needham Public Schools; and Paul Comerford, MBMD Supervisor.

Secondary research: Additional research was conducted to ascertain information about weight-based school waste assessments in other school districts, volume-to-weight conversion information for solid waste, the current state of food waste recycling in Massachusetts's schools, and systems for addressing large-volume waste streams including polystyrene food service trays.

V. Current System

The Needham Public School system is comprised of one high school, one middle school, and six elementary schools. For the current school year, one of the elementary schools (High Rock) is not in service; the public library is being housed at that location during renovations. Below are some of the basic statistics for the public schools:

2004-2005 School Year

School(s)	# Students	# Teachers/staff
High School	1,429 students	130
Middle School	1,065 students	135
Elementary Schools (5)	2,408 students	382

At this time, both solid waste and recyclables are collected, at least to some extent, in all of the public schools. Note: Needham High School is the largest public building in the town.

A. Solid Waste

The MBMD oversees the contract for the collection of solid waste at all schools (and certain municipal buildings), including the following buildings (with service schedules):

BUILDING	DUMPSTER SIZE (TRASH)	SERVICE SCHEDULE
Needham High School	12 cubic yards	Daily, M-F
Pollard Middle School	10 cubic yard	Daily, M-F
Broadmeadow School (Elementary)	6 cubic yard	3 times/week, M-W-F
Eliot School (Elementary)	6 cubic yard	3 times/week, M-W-F
Hillside School (Elementary)	6 cubic yard	3 times/week, M-W-F
Mitchell School (Elementary)	6 cubic yard	3 times/week, M-W-F
Newman School (Elementary)	10 cubic yard	Daily, M-F

In addition, the following public buildings are serviced for solid waste collection under the same contract:

- Emery Grover Building: 4 cubic yard dumpster, picked-up once/week
- Police/Fire Station: 6 cubic yard container, picked-up 2 times/week
- Fire Station: 2 cubic yard container, picked-up once/week
- Public Library: 6 cubic yard container, picked-up once/week

From September -June, the trash contract provides for collection of up to 9,048 cubic yards of trash from all schools combined. During summer and vacation weeks (total of 13 weeks in this school year), trash is collected once per week at each school, providing for the collection of up to 728 cubic yards of solid waste. (Note: Per Paul Comerford, many of the schools are used for day care in the summer, though no food service is available). For the four non-school buildings serviced under this trash contract, up to 1,248 cubic yards of trash are collected during the entire year. Combining these numbers, the current trash contract will provide for the collection of up to 11,024 cubic yards of waste from all schools and public buildings serviced in a given year.

Cost for Solid Waste Collection and Disposal

Needham school administration officials have indicated that in fiscal year 2004, the Town paid their solid waste contractor $63,870 for services rendered to public schools and municipal buildings. The contract, which expires on June 30, 2005, includes provision of all dumpsters utilized at public schools and selected municipal buildings, along with collection of solid waste (as per schedule noted above) and disposal of solid waste at a licensed disposal facility (currently Wheelabrator/Millbury). The schools pay for trash collection service based on volume (dumpster capacity and frequency of collection), not weight of trash. Dumpster service is provided on a scheduled basis, however, the Town has the right to extend

or decrease scheduled pick-up service as needed. The cost of service can change based on the number of actual pick-ups provided by the vendor. Therefore, unit price per pick-up is fixed, but yearly cost for service provided is variable.

Based on the number of dumpster pick-ups indicated in the contract, the Town is paying about $43.63 per pick-up (of each dumpster). Another way to look at this is with an estimated yearly trash tonnage of 827-992 tons disposed, the Town is paying between $64-$77 per ton for the collection and disposal of trash. If it can be shown that waste generation would decrease substantially based on a new waste reduction practice and/or increased recycling, there is an opportunity for the town to either reduce the size of the dumpster at any given location and/or reduce service levels, which in turn would lower collection (and associated disposal) costs.

Volume of Waste Generated

To estimate the *volume* of waste generated at the public schools, a waste assessment form was created to estimate how full the trash dumpsters were before being emptied, as observed during a two-week period in December 2004. The goal of this part of the assessment was to estimate how much of the dumpster capacity was being utilized in general, not during a season when there is notable fluctuation (e.g., beginning or end of school year when large purchases and/or significant clean-outs are taking place). Because the contracted trash hauler is required to empty dumpsters on a fixed schedule, it is informative to assess how much of the trash capacity provided by the dumpsters is actually being utilized.

The following table summarizes the feedback received via the waste assessment forms completed in December 2004 and January 2005 (Pollard School assessment was scheduled for January 2005, but Supervisor Comerford advised that staff issues at Pollard did not allow waste assessments):

BUILDING	CUSTODIAN REPORTING	CUSTODIAL WASTE ASSESSMENT
Needham High School	Richard Witz	Dumpster was either full to top or overflowing at each observation
Pollard Middle School	No data	No data
Broadmeadow School (Elementary)	Rich Franks	Dumpster volume ranged from 1/2 full to overflowing at each observation (averaging between ¾ and full to top)
Eliot School (Elementary)	Yustil Mejia	Dumpster was either full to top or overflowing at each observation
Hillside School (Elementary)	Thomas Franks	80% of observations recorded full to overflowing dumpster, 20% indicated half-full dumpster
Mitchell School (Elementary)	Walter Godoy	Majority of observations recorded full to top, however range was from ½ full to overflowing
Newman School (Elementary)	Tom Grimes	70% of observations recorded ¾ full, 30% of observations recorded full to top

In addition, custodians serving the public library and police department noted that the library dumpster was generally ¾ full with trash, and the police department trash was overflowing. These observations indicate that most of the dumpster capacity is being utilized at the current time, with the limited amount of recycling that is currently taking place.

Weight of Waste Generated
Time and resources available for this project did not allow for actual "weighing" of trash, therefore information from outside sources that have attempted to identify the weight of school-related trash is referenced here. It is relevant to estimate the weight of trash collected because it can help to identify the types of materials to target for diversion, e.g., lightweight items that take up space (volume) in a dumpster versus heavy items that increase costs due to actual disposal (tipping) costs for the hauler.

Based on industry and EPA data (see Attachment 3), we will use an ***average estimated weight of 150-180 lbs./cubic yard*** for school-related trash for all proceeding calculations in this report.

When one takes into account the volume of waste disposed (based on custodial assessments, dumpster size and collection frequency), combined with the above-mentioned weight estimate for a cubic yard of solid waste, we can *estimate* that between 827 and 992 tons of trash are being disposed at Needham Public Schools (exclusive of other municipal buildings) in a given school year.

B. Recyclables
Background (provided by Needham DPW): The Town of Needham Department of Public Works (DPW) together with the Municipal Building Maintenance Division (MBMD) commenced a public building paper recycling program (including schools) in 1999. Since 2003, the DPW has provided assistance with this program by furnishing up to three containers for the collection and consolidation of paper recyclables at various public buildings in Town. Currently, only one 30-yard roll-off container is being used, and it is located at the Pollard Middle School. Upon completion of school renovations at the High School, another paper recycling roll-off will be located there.

Currently, an MBMD staff person transports paper recyclables from all public schools to the roll-off container at Pollard on a weekly basis (Wednesdays). Every two weeks (Saturday), a DPW staff person picks-up the roll-off from Pollard and delivers the paper to the Town's Recycling & Transfer Station (RTS) for recycling. Costs incurred for this service are based on staff time needed to move materials between locations (along with fuel costs). The RTS has a contract with North Shore Recycled Fibers to transport and recycle all paper and cardboard from the RTS to market, and the Town earns $10/ton in revenue for this material. Note: this contract provides for free transportation of recyclable paper and commingled containers, and there is no cost for "tipping" commingled containers for recycling. This arrangement helps offset costs for collection from schools and improves the bottom line for trash and recycling costs overall.

Paper Collection Methods & Containers
The collection of paper recyclables is online at all of Needham's public schools, except for the Mitchell School, which is starting a recycling program at this time. Paper recyclables accepted at the RTS through this program include: newspaper, office paper, paper bags, magazines, catalogs, phone books, paperboard, mail, and cardboard. Schools have been supplied with 7-gallon blue bins in most classrooms and offices, and large 64-95 gallon wheeled carts for consolidating paper recyclables.

Large wheeled carts are in use at each school, as follows:
- High School: 12 carts
- Pollard Middle School: 5 carts (and 30-yard roll-off container)
- Elementary Schools: 2 carts at each school

In the High School, home room teachers direct students to take recyclables from classrooms and deposit materials into large wheeled carts located in the hallways. In the Pollard Middle School and the

elementary schools, one student is assigned from each class to take blue bins to wheeled carts on a regular basis (weekly or more as needed).

Based on stickers used on blue bins and wheeled carts, there is some discrepancy as to which types of paper are accepted for recycling at different schools. Some classroom blue bins have no stickers on them to denote what types of paper are acceptable for recycling; however, most observed stickers read as follows (except at Pollard):

Acceptable Paper

white paper	computer paper
colored paper	mail
envelopes	magazines

Unacceptable Paper

newspaper

The Pollard School was the exception to the rule, as many (but not all) of the classroom blue bins, the wheeled carts, and the 30-yard roll-off were labeled more accurately/completely. At the Pollard, due in part to active engagement by several teachers to support and expand recycling, these containers displayed a more complete list of acceptable paper for recycling, including; newspaper and cardboard (if flattened and placed next to wheeled cart), and all paper types noted on "Acceptable" list above. Bin labels also indicate that staples, paper clips, and notebooks are accepted for recycling.

Current Recycling Rate for Paper

The DPW services the 30-yard container at Pollard and has provided tonnage information for the last calendar year, beginning in January 2004. Paper recycling tonnages collected during this time frame indicate that the weight of the paper collected on scheduled collection days has ranged from as low as .22 tons (440 pounds, March 9, 2004) to as high as 2.25 tons (4,500 pounds, April 6, 2004). The average weight of the 30-yard roll-off in fiscal year 2004 was 1.19 tons; in FY05 (to date) it is 1.34 tons. On a monthly basis, schools are currently recycling about 2.77 tons of paper (including some cardboard). Since the schools are disposing between 69 and 83 tons of solid waste per month, the current recycling rate for paper is approximately 3.2-3.9% (recycling tons/total tons generated). With approximately 25-47% of the schools' waste stream being paper and cardboard (see Section VII. A.), one can deduce that current paper recycling efforts are capturing a very small portion of the available paper for recycling (between 7-16%).

Additional Recycling

Needham High School is also collecting aluminum cans for recycling. There are five containers (approximately 35-gallon) in the cafeteria, with lids cut and labeled for the collection of cans (*not* bottles). This program is new to the High School this year. According to Nathaniel Woodruff, Environmental Sciences teacher, the High School is participating in a program called " Cans for Cancer," so the proceeds from can redemption go to this organization. They are considering donating the proceeds to Habitat for Humanity in the future.

At the Pollard Middle School, a collection program for milk cartons, plastic bottles, and cans was initiated this year (spearheaded by teacher David Harris). Four containers are situated in the cafeteria for the collection of these items. In addition, there are bottle and can recycling containers located outside the gym and in the teachers lounge. Harris estimated that on any given day, one or two 50-gallon bags

containing used milk cartons, bottles, and cans are collected for recycling. These bags are placed on top of the 30-yard paper recycling roll-off by custodians, for collection by the DPW for recycling at the RTS.

The Newman Elementary School collects deposit containers in the teachers lounge. In the custodial area/office, a bottle & can recycling container was observed. These small-scale collections appear to be done by interested individuals willing to service a limited area.

VI. Purchasing Practices

The Project Coordinator met with the Food Service Director for the Needham Public Schools (Ruth Griffin) to gather information about current purchasing practices and the provision of services to students and staff at all school facilities. Per Griffin, the basic system for providing food service at the schools is as follows:

- Cafeterias and kitchens are staffed by school employees.
- All food and food service ware is purchased under the supervision of the Food Service Director; most purchases are made through the TEC Collaborative, a purchasing cooperative serving dozens of area municipalities.
- TEC Collaborative oversees bidding for food/groceries and food service ware (plates, cups, etc.) on a yearly basis.

Griffin provided the following information regarding current purchasing volumes for food and food service ware utilized at Needham public schools (calendar year 2004-2005):

- Approximately 2,500-2,600 lunches are *sold per day.*
- Average *monthly* purchases of cartons of milk:
  Elementary schools: 50,000 cartons
  Middle school: 19,000 cartons
  High School: 12,000 cartons
- About 2,200 cases of food are purchased each *month* (for all schools combined), 5-7% of these cases are #10 cans (with 6 cans per case).
- Out of 4,400 students enrolled in all schools (excluding kindergarten), approximately 2,600 buy lunch at school and 1,800 bring their own lunch
- Plastic bottled beverages *sold per month* in all school vending machines (including water, Gatorade, milk, sparkling water) averages 500 cases of 24 bottles (16 oz. or 20 oz. bottles), totaling about 12,000 bottles per month.
- Canned juice beverages *sold per month* in all school vending machines averages 140 cases of 24 cans each case, totaling 3,360 cans per month.

Griffin noted that unsold hot meals (with protein) are thrown away at the end of the day due to sanitation safety. Other items, if not prepared, could possibly be used the next day (such as fruit and vegetables) and cold sandwiches (if wrapped) can be refrigerated overnight as well. At the end of a week, any excess food in the refrigerators is thrown in the trash. Griffin emphasized that a minimal amount of pre-consumer food is thrown away, as they do very little raw processing of food on the premises. Food service generally buys pre-prepped food (e.g., salad is pre-chopped when purchased), and fruit is whole or canned.

Large quantities of disposable food service ware are purchased for cafeteria and kitchen use in all schools (see Attachment 4). Since food service trays are the item that is purchased in the greatest quantity (and which take up the most space in a dumpster due to size), it is relevant to note that schools are generating (and throwing away) nearly ½ million (450,000) trays in a 10-month school year.

Paper, Toner Cartridges and Janitorial Supplies
Other large volume items purchased include paper, toner cartridges, and janitorial supplies. Sandy Cincotta, Budget Analyst for the Needham Public Schools, estimates that in fiscal year 2004, about 1,427 cases of paper and between 250-300 printer cartridges were purchased for the schools.

Janitorial supplies purchased in large volumes include bathroom tissue, paper towels, and trash bag liners. Information from Paul Comerford regarding current school year purchases of these items is as follows:

Item	Size	# Units	Quantity Per Unit
Plastic Trash Container Liners	55 gallon	402 cases	100 per case
Plastic Trash Container Liners	15 gallon	353 cases	100 per case
Paper Towels		435 cases	6 rolls x 800 ft. per case
Bathroom tissue		192 cases	2 ply, 6 x 1,000 ft. rolls per case

VII. Recycling Potential

In December 2004 and January 2005, the Project Coordinator (with Paul Comerford) visited Needham High School, Pollard Middle School, and Newman Elementary School and made the following observations about what types of materials were commonly found in the trash. These listings also help to identify sources of waste generated.

In classrooms at all schools observed, *trash bins* contained the following items (listed in order by volume observed, from largest to smallest):

- Paper (sheets, newspaper, paperboard)
- Plastic containers (bottles) and cans
- Snack/candy wrappers and other food packaging (e.g., small plastic bags)
- Juice boxes
- Food waste

On occasion, the following items were also observed in classroom trash:

- Overhead transparencies
- Disposable coffee cups
- Paper towels

In cafeteria and kitchen areas, *trash bins* contained:

- Polystyrene trays
- Cardboard boxes
- Plastic containers (bottles) and cans
- Paper (including kraft paper wrap and waxed paper)
- Food waste (some unwrapped)
- Milk cartons
- Plastic wrap
- Foil
- Food service cans
- Plastic utensils
- Paper napkins

A. Target Materials

Observations give us a starting point for determining how much of any given recyclable material can be commonly found in the schools' waste stream, and what materials to target for additional recycling.

- Several custodians expressed that approximately one half or 50% of the waste they transport to dumpsters is generated in the cafeteria and kitchen. They indicated that they regularly observe large quantities of **milk cartons**, **polystyrene food service trays and dish ware**, as well as **food waste** generated at these sources.
- It was also observed that **bottles and cans** are commonly found in the trash. With few opportunities to recycle bottles and cans in the schools, it is clear that most of these containers are being thrown in the trash. This would include all vending machine purchases, cafeteria purchases, in addition to beverages brought from home. From the recycling processors perspective, #10 food cans used in the kitchen may also be added to this recycling mix.

Custodial observations also indicate that **cardboard** is frequently found in trash dumpsters. At the High School, seven out of eight custodial observations indicated that the dumpster contained at least 5% visible cardboard. Custodians from other schools observed dumpsters with between 0- 50% cardboard, with most reporting 2-20%.

Outside Data Sources Offer Weight-Based Estimates

The Project Coordinator researched information from several other programs that have conducted weight-based assessments of school trash. These sources, including the South Shore Recycling Cooperative (MA), Barstow Unified School District (CA), Long Beach Unified School District (CA), New Hampshire School Recycling Program, and Pocono Elementary Center (PA), give us the following range of waste percentages for discarded materials:

MATERIAL	PERCENT OF WASTE STREAM (By Weight)
Paper (including cardboard)	25-47%
Plastic, Metal, and Glass containers	10-18%
Organic materials (food, soiled paper, leaves, grass)	15-32%
Other (including construction waste, hazardous waste, special wastes)	3-5%

B. Potential Increase in Recycling and Reduction in Trash

Paper

Based on this research and information we have from other programs, capturing 50% of available paper for recycling is a feasible goal, and would yield the following results:

- If the recycling program **captures 50%** of paper and cardboard generated (approximately 13-24% of the waste stream) trash tonnage could be reduced by 10-20% by weight. Through current paper recycling efforts, 3-4 % of the school's waste stream is already being diverted.
- A 15% reduction in trash would result in approximately 703-843 tons of trash per year (a reduction of 124-149 tons).
- The associated reduction in trash volume would be 1,378-1,986 cubic yards, or 1,682 cubic yards on average each year. *Weekly* trash collection could be reduced by approximately 43 cubic yards under this scenario.

- For *every ton* of waste reduced, dumpster capacity (or associated collection frequency) could be reduced by between 11-13 cubic yards (with average estimated weight of 150-180 lbs./cubic yard). This could result in significant cost savings for trash collection services.
- As a point of reference, students in nine Cambridge schools with active paper recycling programs recycle an average of 8.6 lbs/student/month or 86 lbs/student/school year (paper and cardboard). If Needham's 4,902 students recycled at this rate, 421,572 lbs. (211 tons) of paper and cardboard could be recycled each year. This represents an 18-22% reduction in trash (falling within the 50% capture range noted above).

If additional materials were targeted for recycling, waste could be further reduced.

Bottles, Cans and Milk Cartons

The Town's RTS can accept all bottles, cans, and milk cartons combined together for recycling. This would likely be the next "easiest" material mix to separate for recycling, because a pilot collection system (Pollard) and recycling processor are already being utilized to manage these materials.

- Purchasing records indicate that about 810,000 milk cartons are purchased during the school year. In addition, about 120,000 plastic beverage bottles and 33,600 juice cans are sold each school year through vending machines and/or cafeteria sales. Last, but not least, kitchens use approximately 1,320 cases of food (totaling 7,920 #10 cans) during the school year.
- If the recycling program could **capture 50%** of this waste stream, the schools could divert another 5-9% of their waste stream. The trash tonnage could therefore be reduced by approximately 7% or 58-69 tons. Current bottle & can recycling efforts are already diverting a small percentage of this waste stream, but actual tonnage is not available.
- The associated reduction in trash volume would be 644-920 cubic yards, or 782 cubic yards on average each year. *Weekly* trash collection could be reduced by approximately 20 cubic yards with a bottle & can collection program.

Food Waste and Polystyrene Trays

The other most significant waste streams that could be addressed for waste reduction would be food waste and polystyrene food service trays. Food waste is very heavy and comprises a significant portion of the waste stream (estimated to be ~15-25% of trash, by weight). On the other hand, polystyrene trays are very light in weight, but take up a significant amount of volume in the trash dumpsters because of their size and the quantity used.

- As noted earlier, approximately 2,500-2,600 lunches are sold *per day*
- Needham schools may benefit from developing an organics composting program, including food waste and possibly soiled-paper waste and biodegradable food service ware. The City of Northampton has a ***food-waste*** composting program in place at four elementary schools and one middle school. On average, they collect 46 lbs/student/year (food waste). Northampton's Program Coordinator advised that most of the weight is coming from the kitchen, and some is from plate scrapings. If Needham's 4,902 students separated food waste for composting at this rate, 225,492 lbs. (113 tons) could be composted each year. This represents an 11-14 % reduction in trash. It is important to keep in mind that if Needham schools conduct less food preparation in the kitchen (relative to Northampton), the amount of food waste that could be captured for composting may be less than this estimate.
- As noted earlier, schools are throwing away nearly ½ million (450,000) ***polystyrene food service trays*** in a 10-month school year. Observations made by custodians and the Project Coordinator attest to the fact that as much as half the *volume* of waste coming out of the cafeteria each day is polystyrene food trays. If an alternative method for managing trays proved feasible (e.g., recycling trays, switching to compostable paper trays, or converting to reusable/washable trays),

it is estimated that Needham could divert an additional 15-25% of the waste stream (by volume). Recycling polystyrene food service ware *does* present a challenge since the recycling markets for polystyrene trays are few and far between. The most feasible alternative is to switch to biodegradable paper trays, biodegradable utensils, and to institute a food waste composting program where food and trays are collected together.

C. Teacher and Administration Surveys

In order to get a snapshot of recycling potential and support from the administration, surveys were sent to the Principals of each school to gather their feedback (all were contacted except for the Mitchell School, where a recycling program is being set-up at this time). Completed surveys were received from all six Principals contacted (see Attachment 2 for survey). Survey results from Principals (see Attachment 5) indicate that basic program elements (e.g., blue bins) must be provided along with increased education to ensure that all are aware of current recycling opportunities. Most are participating in the recycling program to some degree, and would welcome an expanded program to accept additional materials. Better labeling of bins and signs were suggested.

High School Teachers

With the assistance of Nathaniel Woodruff, Environmental Science Teacher at the High School, surveys were given to all 130 teachers in their "morning folders." Fifty completed surveys were returned, representing a 38% response rate. The main goal here was to gather anecdotal information about the current recycling program and feedback on how it could be improved, as suggested by program participants. Survey results can be found in Attachment 6.

Feedback provided from these teachers indicates that most have recycling bins in their classrooms. There is also a broad range of understanding about what materials are acceptable for paper recycling in the current program. Many reported the desire to have better signage indicating what materials are accepted in the program and to reduce contamination of bins. In general, teachers stated that current bins would meet recycling needs if containers were emptied more frequently. Many expressed the desire to implement bottle & can recycling, cardboard recycling, and printer cartridge recycling (in order by preference). Many ideas and suggestions were offered for improving the program; see Attachment 6 for comments. Several teachers noted increases in trash generated before holidays and vacations, and at the end of each term/school year.

School Administration Building

Paul Comerford completed one survey on behalf of the School Administration Building, where MBMD and other administrative offices are located. He noted that blue recycling bins were in offices, that all types of paper products and cardboard are currently accepted for recycling, and that more and/or bigger blue bins and better signage would be necessary if everyone recycled all the paper products accepted at the RTS. He also mentioned the desire to see bottle & can recycling (especially for plastics) as well as recycling of hard cover books and printer cartridges. According to Comerford, recycling policies are not included in the student handbook.

VIII. Issues and Recommendations

The information provided in the previous sections gives a good idea about the types of large-volume materials entering and leaving the school buildings during a typical school year. By weight, we have estimates that between 25-47 % of the waste stream is paper, and that between 10-18% of the waste stream is comprised of plastic, metal, and glass containers. **This indicates that a very large portion (at least 1/3) of what is generated at the schools is *easily recycled* through the current program at the Town's RTS.** Another 15-32% of organic waste could be composted (food, soiled paper, leaves, grass),

if a cost-effective system were put into place to separate these materials. Polystyrene food service ware that is purchased in very large quantity might also be addressed, as this waste stream uses a substantial amount of the dumpster volume for trash, and the hauler is essentially "transporting air" (this material is so lightweight it is extremely costly to manage). This does present several challenges, however, since the recycling markets for polystyrene trays are few and far between.

It is recommended that Town and school officials establish a team to expand current recycling efforts in all public schools and the school administration building. This team could start by addressing a "maximum paper recycling program," since most of the infrastructure/necessary elements are already in place to do this, and the RTS wants this material (they currently earn $10/ton for all paper and cardboard they collect). Secondly, a bottle and can recycling program appears to be the next obvious material to target for recycling (including milk cartons). Some individuals have attempted to begin small-scale efforts already, and the prevailing sentiment is that this is necessary and would receive support/active participation. In addition, the RTS can currently accept plastic, glass, and metal bottles and cans for recycling and they are not charged for transportation and processing of these materials once they are deposited at the RTS.

Because of the weight and volume of waste generated in the kitchen and cafeteria (food waste, polystyrene food service ware, etc.), this significant waste stream could be addressed through exploration of a food waste composting program (Northampton is a good model, see Attachment 7 for information). In addition, the sheer volume of polystyrene food service ware entering the waste stream warrants further assessment of alternative ways to manage this material. The most feasible alternative is to switch to biodegradable paper trays, biodegradable utensils, and to institute a food waste composting program where food and trays are collected together.

In order to expand the current recycling program, a number of issues should be considered to support program implementation, including:

Materials

- Cardboard: Some of the cardboard cartons delivered to kitchens are shrink-wrapped, so plastic must be removed before recycling cardboard (make standard practice).

- Bottles and Cans: Place collection containers near all vending machines, and in all other places where beverages are consumed (cafeteria, classrooms or hallways, teachers' lounges). Comerford suggested that different color containers be used for bottle and can recycle versus paper recycling, to distinguish more easily. (Note: Ball fields managed by the Parks and Forestry Department may be brought into the discussion to devise a program to collect bottles and cans generated at ball practice, events, etc.).

- Food waste: Explore local outlets for composting and other options for managing this waste (e.g., food waste disposers that pulverize material, add to human waste, and process at wastewater treatment plant- there is a Middle School in NY that uses this system).

- Polystyrene trays and food service ware: Explore recycling outlet (Michael Forrest, Evergreen Partnering Group at 978-764-4159) or explore biodegradable cutlery and food service containers if food waste composting is under consideration. Reusable trays may be considered as well if sanitation code allows for this.

- Specify process and identify contact person to assist with proper disposal/recycling of other items observed by custodians: such as electronic equipment (e.g., slide projector) and textiles.

Recycling Containers

- Ensure that ALL classrooms and offices have blue bins (conduct a survey, or assign a group of students to do this and report back to the town so that bins can be distributed to those without). (Random observations indicated that most classrooms and offices had blue recycling bins, but some did not).

- Ensure sufficient quantity and size recycling containers for different materials to be collected (including wheeled carts in hallways and dumpsters). Custodians have suggested that additional wheeled carts for paper recycling would be needed at each school to accommodate increase in paper recycling. Another consideration is space for additional recycling roll-offs and/or dumpsters outside school buildings for better material consolidation (only Pollard has a 30-yard container at this time, this High School will get one after renovations).

Signage and Bin Stickers

- It is time for new stickers and signs to be distributed to all schools to more accurately identify materials accepted for recycling. Recycling bin stickers should indicate what is and what is not acceptable and how to prepare materials (e.g., cardboard). For bottles and cans there must be easily distinguished containers/stickers with similar information including any preparation requirements (emptying contents/rinsing). (Random observations indicated that some bins had no stickers, some were inaccurate, and some were correct).

- Provide signage with consistent design or look, that the town or school department might produce, for all container locations.

- Signs should be posted as many places as possible where there are trash and/or recycling bins, but at a minimum in hallways where recyclables are consolidated. These signs should list acceptable recyclables as well as a brief snapshot of the state's Waste Bans (state regulations that prohibit the disposal of certain recyclable materials and hazardous waste in the trash). Waste Bans signs/stickers should be placed on all trash receptacles (including dumpsters) as well.

General Recycling Education

- There are limitless ways that recycling education could be addressed in order to better inform students and staff about program goals, benefits, and reasons to participate. Attachment 8 lists a number of mechanisms that could be utilized to support an expanded recycling program in the schools.

Source Reduction

- While the focus of this report has been on increasing recycling, one should keep in mind that reducing waste before it is generated provides the greatest value with respect to reducing trash tonnage and realizing environmental benefits. A few ideas are noted below, some of which came from teachers and administrators directly.
    - Ken High from the Pollard Middle School has posted signs near copiers encouraging teachers to double-side copies whenever possible. This could be promoted in all school buildings. Additionally, staff communications (memos, weekly parent meetings, etc.) that are distributed on paper could all be sent electronically. At the beginning of the school year, all teachers receive a handbook including numerous forms—it is suggested that these be distributed electronically as well. The Project

Coordinator was advised that the amount of junk mail and catalogs received by teachers is staggering—multiple copies are sent to schools, and these are not shared. Perhaps an effort could be undertaken to contact mail houses to reduce junk mail, and a "library" of catalogs could be available to teachers to avoid duplicate copies.

- Exploring the possibility of using durable and reusable food service trays in the school's cafeteria provides an opportunity to dramatically reduce waste.
- It may be advisable to implement a consistent classroom snack policy that defines what is acceptable in the classrooms and encourages waste reduction practices (see www.wastefreelunches.org) and recycling at the same time.
- On-site composting: A number of schools in various parts of the country have composting programs in place on the school grounds to both reduce waste and teach students about the ecology of composting and the nutrient cycle. In some schools, compost generated through this process is used to support on-site organic gardens that are used as teaching tools while at the same time supplementing lunch offerings.

Other Issues

While conducting research for this report, two other issues arose that are worthy of consideration for this project. One teacher advised that the "dumpsters are never closed", and that "custodians say that neighbors put trash in the dumpsters." Whether this is a rare occurrence or an ongoing problem, it is important to not only close, but also lock dumpsters when not in use. This is especially true in a municipality that has a pay-as-you-throw trash system for residents, whereby they pay for every bag of trash they dispose. Open dumpsters offer a tempting way to bypass this program.

Secondly, it could be very instructive to work with school purchasing agents to make the connection between supplies purchased and trash volumes generated (along with associated costs). Since different departments oversee different parts of this process, and the cost for trash removal is not apparent to (or the responsibility of) purchasing agents, an effort to bring these parties together to identify opportunities for waste reduction and potential cost savings could prove very beneficial to overall recycling program goals.

If Needham officials choose to embark on this program to expand recycling in the schools, they will once again prove their leadership and vision as they work to reduce waste and increase recycling. These actions should prove to be cost-effective and they will result in significant environmental benefits for the town and the Commonwealth.

ATTACHMENT 1

Town of Needham, Massachusetts
Public School/Building Waste Assessment

Dumpster Audit Form

School/Building_____ Size of Dumpster (if known)_____

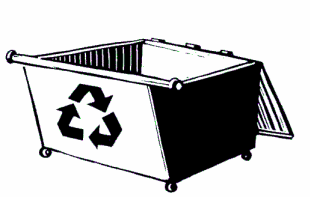
Day_____ Date_____ Time_____

Your Name_____

Step One: Do a visual assessment of **how much waste** is in the dumpster **before it is emptied**.

Is dumpster (***please check one***):

Half Full_____
¾ Full_____
Full to Top_____
Overflowing_____
Other_____



Step Two: Do you see **cardboard** in the dumpster? _____ YES _____ NO

How much cardboard do you see (***please check one***)?

10%_____ 20%_____ 30%_____ Other (please note %)_____

Do you see any **other materials** outside of bags? _____ YES _____ NO

Please note what material(s) you observe_____

_____

_____

Other Comments_____

_____

Step Three: Return completed form to Paul Comerford at the end of each day.

THANK YOU!

Printed on recycled paper with 30 percent post-consumer content.

ATTACHMENT 2

Needham Public Schools

Recycling Survey for Teachers and School Administration

Municipal and school officials in the Town of Needham are undertaking a project to expand paper recycling in the schools and identify other materials that could be recycled. By completing the following survey, you will provide valuable information to support this effort.

***NAME*_____*DATE*_____**

1. Do you have a paper-recycling blue bin in your classroom/office? **Yes**_____ **No**_____

2. What paper items are frequently **recycled** in your classroom/office?

_____

_____

3. Did you know that you could **currently** recycle the following types of paper? (**Y = Yes, N = No**)

Newspaper_____	Colored paper_____
Telephone books_____	Soft cover books_____
File folders_____	Junk mail, catalogs, and envelopes_____
Boxboard/paperboard, e.g., tissue boxes_____	

4. If your class/office recycled all of the paper items listed above, would the blue bins you have provide sufficient space to meet paper-recycling needs? **Yes**_____ **No**_____

5. Are there sufficient signs on or near bins to identify what paper items can be recycled? **Yes**_____ **No**_____

6. Do you see contamination of paper-recycling bins (e.g., trash thrown in blue bins)? **Yes**_____ **No**_____

7. What items/materials would you **like to recycle** if a collection program was available? (Please ✔)

____Cardboard	____Hard cover books
____Bottles and cans	____Printer cartridges
____Food waste	
____Other (please specify)_____	

8. We are very interested in getting your ideas and suggestions on how to improve recycling in the schools. Please take a moment to list your ideas here (attach additional sheet if necessary):

_____

_____

_____
_____

9. Do you observe seasonal fluctuations in the amount and types of **trash** generated? Please describe.
_____
_____
_____

10. Are snacks (food and drinks) allowed in classrooms? **Yes_____ No_____**

11. Is there a school policy regarding classroom snacks? **Yes_____ No_____**

Please send completed survey to Kathi Mirza by DATE_____:
Kathi Mirza, Regional Recycling Coordinator, Fax: (508) 821-1437, E-mail: kmirza@tmlp.com

Thank you!

ATTACHMENT 3

Estimated weights for a cubic yard (CY) of solid waste are noted below:

INFORMATION SOURCE	WEIGHT ESTIMATE (PER CY)
Massachusetts DEP	250-300 lbs. (loose Municipal Solid Waste, not explicitly schools)
EPA (U.S.)	200-225 lbs. (loose Municipal Solid Waste, not explicitly schools)
South Shore Recycling Cooperative (From actual weight assessment in schools, 2002)	180 lbs.
Wellesley Trucking's Estimate (Needham Public School's current trash hauler)	~130 lbs. (depending on rain and cafeteria waste)

ATTACHMENT 4

Disposable Food Service Ware Purchased (2004-2005 school year)

Item	**Price Per Case**	***Monthly* Amount Purchased**
Polystyrene trays	$13.48	90 cases (500 trays per case)
Soup Cups	?	Few
#3 Food trays (Boats)	$11.51	2 cases (500 per case)
Forks	$5.26	14 cases (1,000 per case)
Knives	$5.26	4 cases (1,000 per case)
Spoons	$5.26	7 cases (1,000 per case)
Napkins	$17.64	6 cases (8,000 per case)
Straws	$6.48	6 cases (12,000 per case)
4 oz. Cups	$11.43	6 cases (1,000 per case)
8 oz. Bowls	$16.77	2 cases (1,000 per case)
Vinyl Gloves	$26.33	8 cases (1,000 per case)

ATTACHMENT 5

Recycling Survey Results From Needham School Principals

January 2005

Based on responses received from all Principals (six), except for Mitchell School:

- Two of the six Principals do **not** have a recycling blue bin in their office.
- All reported that they recycle white or copy paper. Principals at Broadmeadow and Pollard also reported additional paper items that they regularly recycle, including: mail and magazines (Broadmeadow); newspapers (both); and cardboard boxes (Pollard). The Eliot School Principal also reported that a fair amount of shredding of confidential mail takes place.
- When asked if they knew which types of paper could currently be recycled:
    - Newspaper: all reported Yes
    - Telephone books: 2 of 6 reported No
    - File folders: 2 of 6 reported No
    - Boxboard/paperboard: 2 of 6 reported No, one left unanswered
    - Colored paper: 3 of 6 reported No
    - Soft cover books: 5 of 6 reported No
    - Mail, catalogs, envelopes: 2 of 6 reported No
- When asked if their current blue bin would provide sufficient space to recycle all materials accepted in program, 5 said No and 1 said Yes.
- When asked if there were sufficient signs on or near bins to identify what can be recycled, all reported No.
- When asked if they see contamination (trash) in blue paper-recycling bins, 3 said No, 2 said Yes, one left unanswered.
- When asked if there were items they would like to recycle if a collection program was available:
    - Cardboard: 4 said Yes
    - Bottles & Cans: 4 said Yes
    - Food Waste: 1 said Yes, 1 said No, others left unanswered
    - Hard Cover Books: 2 said Yes
    - Printer Cartridges: 5 said Yes (of which 2 said they already do this)
- Other ideas and suggestions offered are as follows:
    - Provide clearly marked bins that are emptied regularly
    - More custodial staff would be needed to expand program
    - Post simple, large posters indicating what can be recycled
    - Provide central locations for additional collections (though space is an issue)
    - Would love more recycling opportunities for students and staff as long as someone else takes it away.
- Seasonal fluctuations in trash generated: the only observation received was that more paper was generated at the end of the year when cleaning occurs.
- Regarding food and drinks in classroom:
    - All said that food and drinks are allowed in the classrooms.
    - There was mixed feedback as to whether this is an actual school policy or whether it is at the teacher's discretion.

ATTACHMENT 6

Recycling Survey Results From Needham High School Teachers

January 2005

Based on responses received from 50 of 130 teachers:

- Three of the 50 teachers do **not** have a recycling blue bin in their classrooms (though one of these reported using a box for recycling).
- Nearly all reported that they recycle white or copy paper.
    - 2 reported that they recycle posters
    - 3 reported that they recycle cardboard
    - 1 reported that s/he recycles boxboard
    - 6 reported that they recycle mail and envelopes
    - 5 reported that they recycle newspaper
    - 3 reported that they recycle colored paper
    - 1 recycles packaging
    - 2 recycle nothing (since they have no blue bin in their rooms)
- When asked if they knew which types of paper could currently be recycled:
    - Newspaper: 32 reported Yes, 18 reported No
    - Telephone books: 26 reported Yes, 24 reported No
    - File folders: 28 reported Yes, 22 reported No
    - Boxboard/paperboard: 25 reported No, 23 reported Yes, 2 left unanswered
    - Colored paper: 35 reported Yes, 14 reported No, one left unanswered
    - Soft cover books: 34 reported No, 15 reported Yes, one left unanswered
    - Mail, catalogs, envelopes: 34 reported Yes, 16 reported No
- When asked if their current blue bin would provide sufficient space to recycle all materials accepted in program, 27 said Yes (4 noted Yes if recyclables were collected more frequently, at least weekly) 20 said No, 3 left unanswered.
- When asked if there were sufficient signs on or near bins to identify what can be recycled, 30 reported No, 19 said Yes (but that labels needed to be updated), one left unanswered.
- When asked if they see contamination (trash) in blue paper-recycling bins, 39 said Yes, 10 said No, one left unanswered.
- When asked if there were items they would like to recycle if a collection program was available:
    - Cardboard: 21 said Yes
    - Bottles & Cans: 44 said Yes
    - Food Waste: 2 said Yes, 1 said they could see this as a big problem
    - Hard Cover Books: 8 said Yes
    - Printer Cartridges: 13 said Yes
- Other ideas and suggestions offered are as follows:
    - Classrooms need bigger bins that need to be emptied more often/regularly
    - Need more collection areas for bottles & cans (including classrooms)
    - Recycle plastic in the cafeteria
    - Have multiple bins in classrooms: increased convenience = increased recycling
    - Have programs to get kids more involved/willing to recycle
    - Have a bottle & can recycling area on each hallway
    - Have incentives to recycle
    - Make the students responsible
    - Recycling bins should be placed at all entrances and there should be 2 in each hallway
    - Place recycling bins in cafeteria for plastic bottles, and place several bins throughout café.
    - Program worked very smoothly when a (Environmental) Club member was assigned to each floor and came by weekly for pick-up. Now it rarely gets emptied.
    - Need larger recycling containers that are labeled- consistency from room to room is good for students.
    - Report benefits, trends (local/national), post statistics
    - Need bins in all classrooms (some don't have), and be clear on location of central dumping bins
    - Custodians should collect recyclables once or twice/week
    - Supply bottle & can recycling bins with holes cut in top to only allow those items to be deposited
- Seasonal fluctuations in trash generated:
    - See more water bottles in warmer weather
    - End of term and end of year, rise in trash and recycling occurs (clean-out files)

    - More junk before vacation and holidays
    - More trash when art supply orders come in
    - Lots of waste on bagel day
- Regarding food and drinks in classroom:
    - 17 said that food and drinks are not allowed in the classrooms, but there is latitude here
    - There was mixed feedback as to whether this is an actual school policy or whether it is at the teacher's discretion.

ATTACHMENT 7

Northampton's Food Waste Composting Program (School)

For detailed information about Northampton's Food Waste Composting Program in their public schools, see the following website:

- Go to www.cetonline.org
- Click on Publications
- Go to **Composting - Farm and Commercial Scale**
- View: Composting in Restaurants and Schools- A Municipal Toolkit
- For RFP information, view: Sample Northampton School Composting RFB

ATTACHMENT 8

Recycling Education Mechanisms

The following list includes a variety of elements that may be incorporated into the school recycling program in order to achieve maximum participation and program benefits.

1. **Administration**: Work to achieve top-down support from administration officials (Principals, School Superintendent, School Committee) to provide leadership and acknowledgment of commitment to program goals.

2. **Teachers & Staff (including food service and custodial):** Ensure that all staff are educated about program goals, expectations, how to participate, and results of efforts on an ongoing basis. Provide information to new employees about the recycling program and how to participate.

3. **Program Monitors**: Get volunteers or assign program monitors to oversee certain key aspects of the program, e.g., bottle & can and milk carton recycling. This may include teacher oversight (like Pollard) or students, e.g. Environmental Club. Perhaps eligible students could earn community service hours through participation in recycling program oversight.

4. **Recycling Bins, Signs & Posters, Bin Stickers**: Ensure that all program participants have easy access to recycling bins and that these containers are properly labeled. Provide recycling containers for bottles & cans everywhere these items are sold or used (near vending machines, in cafeterias, in or just outside classrooms, teachers' lounges). Posters and signs can help to reinforce the message conveyed on container stickers. The Food Service Director may be able to assist with building a partnership with the school's beverage distributors (Coca Cola and Poland Spring) to enlist their support in providing recycling containers that would be located near vending machines and in other appropriate locations.

5. The schools would benefit from participation in the **Mass. DEP's Green Team Program**. It works to identify interested teachers in each school to spearhead recycling program participation. The Green Team can provide equipment (e.g. containers), student activities to promote recycling awareness and action, and a substantial library of teaching tools (videos, books, etc.) to assist with recycling education for students.

6. Schools could also tap into the **Mass. DEP's Solid Waste Curricula** to educate students about solid waste, recycling, composting, and waste reduction, all of which are designed to meet MCAS curriculum frameworks. Activities and curricula are available for all grade levels, K-12, offering a wide range of choices incorporated within art, science, language, civics, and other classes.

7. **Make It Fun, Create Incentives to Recycle**: With a recycling program expansion, a kick-off "event" could be organized (e.g. recycling entertainer in each school) to bring everyone's attention to the program and educate on how to participate. Contests could be formulated (e.g., between schools based on per student generation or percent recycling improvement) with the winner earning a school "prize," e.g., recycled plastic bike rack or other appropriate prize. (Cambridge used a School Recycling Incentive Program to increase recycling by sharing recycling revenues with schools). Incentives to increase recycling could also be offered to custodians and staff, with public recognition of recycling improvements or small financial rewards.

8. **Tours and Ongoing Program Feedback**: To educate students and staff about recycling and waste reduction, tours of the Needham RTS could be scheduled on a regular basis (quarterly or bi-yearly). Increase participation in recycling by educating school officials and students about how materials are recycled, to dispel misconceptions about what happens to it after it leaves the schools. Class assignments could be designed to foster a more in depth look at how the program works, where trash and recyclables go from the RTS, etc. Either through Green Team participation or administration

oversight, progress reports on recycling efforts at each school should be publicized on a regular basis, noting the environmental benefits of the program.

9. **The Student Handbook** for each school could incorporate a section on the policy for recycling, what is expected, program goals, and how to participate. This could include a statement about the environmental and financial benefits of recycling and reducing waste. It could also provide for a yearly forum on the topic, providing an opportunity for interested families and school staff to discuss successes and opportunities for improvement.

10. Increase efforts to **Buy Recycled**: Work with purchasing officials to help close the loop by purchasing items that have recycled content or are environmentally preferable. In FY04, school administration officials purchased 1,427 cases of paper at a cost of $25,733 ($18.03/case), and $13,438.06 was spent on toner cartridges. Efforts could be made to purchase recycled-content paper and remanufactured toner cartridges. This can be particularly cost-effective if schools request these items through a larger purchasing cooperative. Follow current practices of janitorial purchases, whereas paper towels and bathroom tissue purchased contain recycled content.